Level 4-kilomol-Predicting reactions, what does it involve?

Predicting chemical reactions requires the ability to write chemical formulas, decide upon states, recognize types of reactions and balance the resulting reaction equation. In this level you will be required to do part One **or** Part Two and **ALL** of Part Three.

Part One

Balance the following equations AND identify the Reaction type.

1. $Al(s) + O_2(g) \rightarrow Al_2O_3(s)$
2. $HCl(aq) + Ca(OH)_2(aq) \rightarrow HOH(l) + CaCl_2(aq)$
3. $CH_4(g) + O_2(aq) \rightarrow CO_2(g) + H_2O(g)$
4. $Zn(s) + Pb(CH_3COO)_2(aq) \rightarrow Pb(s) + Zn(CH_3COO)_2(aq)$
5. $SO_3(g) + H_2O(l) \rightarrow H_2SO_4(aq)$
6. $HgO(s) \rightarrow Hg(l) + O_2(g)$
7. $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$
8. $NaI(aq) + Pb(NO_3)_2(aq) \rightarrow PbI_2(s) + NaNO_3(aq)$
9. $Cl_2(aq) + NaI(aq) \rightarrow I_2(aq) + NaCl(aq)$
10. $Al_2(SO_4)_3(aq) + Ca(OH)_2(aq) \rightarrow Al(OH)_3(s) + CaSO_4(s)$
11. $Al_2(SO_4)_3(aq) + Ca(HCO_3)_2(aq) \rightarrow Al(OH)_3(s) + CaSO_4(s) + CO_2(g)$

Part Two OR

Predict the formulas and states for the products of the following reactions. Give the reaction type and balance the resulting equation.

12. $C_8H_{18}(l) + O_2(g) \rightarrow$
13. $H_2O(l) \rightarrow$
14. $H_2SO_4(aq) + Al(OH)_3(s) \rightarrow$
15. $Cl_2(g) + KBr(aq) \rightarrow$

Part Three This Part MUST BE DONE

From the names of the given reactants, do the following:

A) Give the reaction type
B) Predict the products and write a balanced equation
C) Complete the word equation

BE SURE TO INCLUDE THE STATE OF MATTER SUBSCRIPTS FOR ALL REACTANTS AND PRODUCTS. ***ASSUME aqueous solutions for compounds in single and double replacement reactions.(This means you must consult a solubility table)***

16. Ammonia →
17. zinc + hydrochloric acid →
18. aluminum + oxygen →
19. acetic acid + barium hydroxide →
20. iron(III) nitrate + sodium hydroxide →
21. mercury (II) oxide →
22. butane $C_4H_{10}(g)$ + oxygen →
23. strontium hydroxide + sodium sulfate →
24. hydrogen + oxygen →
25. copper + silver nitrate →

26. For each reaction in Part Three, list evidence that you might see in the lab that would tell you that a reaction had taken place.